(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
12 July 2001 (12.07.2001)

PCT

(10) International Publication Number
WO 01/50389 A2

(51) International Patent Classification[7]: G06F 17/60

(21) International Application Number: PCT/US00/35566

(22) International Filing Date:
29 December 2000 (29.12.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/174,147 31 December 1999 (31.12.1999) US

(71) Applicant *(for all designated States except US)*: **ALLIED MACHINE & ENGINEERING** [US/US]; 485 West 3rd Street, Dover, OH 44622 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **FIEGL, Gregory, D.** [US/US]; 228 Kent Cr., N.E., New Philadelphia, OH (US).

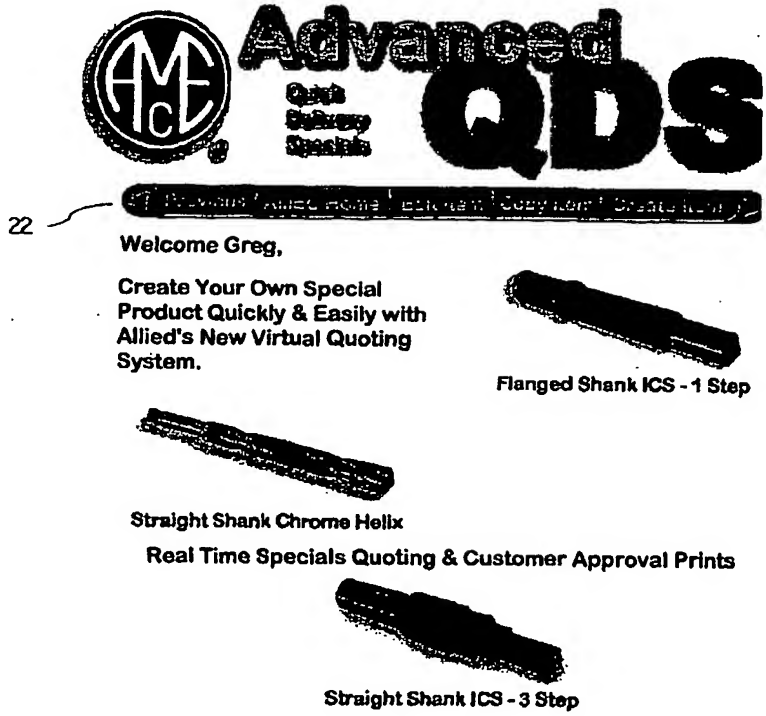
(74) Agent: **OLDHAM, Scott, M.**; Oldham & Oldham Co., L.P.A., Twin Oaks Estate, 1225 West Market Street, Akron, OH 44313 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR PREPARING QUOTES AND ORDERING



(57) Abstract: The invention provides a system and methods for designing and quoting customized goods, resulting in an offer for purchase of such customized goods. Due to the characteristics of the system and methods according to the invention, the capability also exists to implement the system via a global information network, allowing the user to effectively design the

[Continued on next page]

WO 01/50389 A2

patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *Without international search report and to be republished upon receipt of that report.*

customized product, receive a quote from the manufacturer and order the customized product on-line via the global information network, such as the worldwide web. In such an embodiment, a graphical user interface provides communication with the user to prompt required information for design of the customized product to meet the specific needs of the user. Upon submission of the required information, the system and methods according to the invention will preferably prepare a quote for manufacture of the customized product by analysis of the best manufacturing process for manufacture of the customized product. It is a further aspect of the invention that the user by submitting required information, may be provided with a drawing of the customized product for inspection prior to ordering the product via the system and methods of the invention. It is a further aspect of the invention that depending upon the information submitted by the user, the customized product designed using the information can be assessed as to technical feasibility.

SYSTEM AND METHOD FOR PREPARING QUOTES AND ORDERING

Technical Field

This invention relates to a system and methods for quoting and ordering goods tailored to a users specifications, particularly relating to tooling for manufacturing processes. More particularly, the system and methods according to the invention allow a user to design, quote and order custom tooling, and which is particularly adapted to use via a global information network.

Background of the Invention

Depending on a users requirements with respect to the manufacturing of a variety of parts, components or goods, special tooling may be required to facilitate the manufacturing process. As an example, drilling tools adapted to cut a workpiece in a desired manner must be specifically designed to perform the intended machining process. To form a desired hole configuration using a drilling tool, the tool may be required to have multiple cutting surfaces of desired shape and dimension to result in a given configuration when used. Drilling tools used for machining of workpieces may include the use of drill holders and cutting inserts selectively attached thereto in a manner to form the desired hole configuration in a drilling operation. The cutting inserts provide the ability to selectively change inserts when the cutting surfaces thereon have been worn. In this manner, a drill holder can be reused in successive machining operations simply by changing the cutting inserts. Depending upon the machining operation intended, the drilling holder and cutting insert designs will change, and therefore these components must be tailored to the specific application for which they are to be used.

In the past, the design and manufacture of the drill holder and/or cutting inserts has depended upon a manufacturer of such components to obtain information relating to the machining operation to be performed, and thereafter custom designing a tool to perform such operation. As the information required to facilitate designing tooling for a specific purpose can vary significantly, this process has been prone to errors, and is also resource and/or labor intensive. Further, the effort to design appropriate tooling typically will only result in the ability to provide the user with an estimated cost for manufacturing the tooling, which is submitted to the user as an offer. The manufacturer then must receive acceptance of the offer by the user before a "sale" is made and manufacturing of the tooling commences. Thus, the effort to design and quote the tooling may not result in a commercial transaction, and the time and effort applied to such activities is not

compensated for. Thus, it would be of particular advantage to provide a system and method which would allow a customized product, such as tooling used in manufacturing processes, to be more easily designed and quoted by the manufacturer. It would also be advantageous to minimize the effort and resources applied to develop the design and quote for such a customized product.

Summary of the Invention

The present invention is therefore directed at overcoming the limitations of past practice, and providing a system and methods for designing and quoting customized goods, resulting in an offer for purchase of such customized goods. Due to the characteristics of the system and methods according to the invention, the capability also exists to implement the system via a global information network, allowing the user to effectively design the customized product, receive a quote from the manufacturer and order the customized product on-line via the global information network, such as the worldwide web. In such an embodiment, a graphical user interface provides communication with the user to prompt required information for design of the customized product to meet the specific needs of the user. Upon submission of the required information, the system and methods according to the invention will preferably prepare a quote for manufacture of the customized product by analysis of the best manufacturing process for manufacture of the customized product. It is a further aspect of the invention that the user by submitting required information, may be provided with a drawing of the customized product for inspection prior to ordering the product via the system and methods of the invention. It is a further aspect of the invention that depending upon the information submitted by the user, the customized product designed using the information can be assessed as to technical feasibility.

These and other objects and advantages of the invention will become apparent upon a reading of the detailed description of preferred embodiments, with reference to the accompanying figures.

Brief Description of the Drawings

Fig. 1 is a depiction of a relationship driven web page associated with an embodiment of the present invention.

Fig. 2 is a depiction of a relationship driven web page allowing the user to select a tool body type for creating a desired tool.

Fig. 3 is a depiction of a relationship driven web page allowing the user to select the length and other specifications of the tool holder associated with a designed tool.

Fig. 4 is a depiction of a relationship driven web page allowing the user to select characteristics of a tooling for a particular application.

Fig. 5 is a depiction of a relationship driven web page to allow the user to select characteristics of a tooling for a particular application.

Fig. 6 is a depiction of a relationship driven web page allowing the user to select a whole profile in the design of a tool.

Figs. 7-8 are depictions of relationship driven web pages for selection of characteristics for a particular form of tooling designed by the user.

Figs. 9-11 are depictions of relationship driven web pages for selecting and designing tool characteristics for a desired application.

Figs. 12-14 are depictions of relationship driven web pages for selecting and designing tool characteristics for a desired application.

Figs. 15-27 are depictions of relationship driven web pages for selection of other characteristics of a tool for a particular application.

Fig. 28 is a depiction of a relationship driven web page which allows a user to select options for quoting, viewing or ordering tooling designed in accordance with the invention.

Fig, 29 is a flow chart relating to assessment of feasibility and creation of drawings related to a tooling designed by a user.

Fig. 30 is an example of a drawing produced by the system according to the invention.

Fig. 31 is a depiction of a quote page produced by the system according to the invention as an example.

Fig. 32 is a flow chart relating to assessment of costs relating to a design tooling for a particular application.

Fig. 33 is a depiction of an order page allowing the user to order a tooling designed in accordance with the invention.

Detailed Description of the Invention

The invention will now be described with reference to preferred embodiments thereof, and particularly in relation to a class of customized tooling that the system and methods according to the invention may be usefully applied. It should be understood that the system and methods according to the invention may also be useful in the design, quoting and ordering of various other customized products in a manner similar to that described with reference to the preferred embodiments. Additionally, the system and

methods according to the invention may be implemented by providing the user with hard copy materials which may be used to submit information required for design, quoting and ordering of the customized product desired by the user.

Figs. 1-33 are directed to a preferred embodiment, and represent a library of relationship driven pages which may be displayed via a global information network to guide a user through a series of interactive operations, wherein information necessary to design a customized product are obtained and analyzed.

Turning to the Figs., the inventive system and methods which allow a user to design, quote and order a customized product may be implemented through use of a graphical user interface (GUI), wherein the user is guided through a series of interactive pages or displays which prompt the user to enter the required information relative to customized product they require. More particularly, the Figs. presented herein relating to the preferred embodiment are directed at the design and quoting of drill holders which use one or more cutting inserts in association therewith. The Figs. represent a series of web pages which prompt the user for required information relative to the type of drill holder they would like to design and obtain a quote thereon. The library of relationship driven pages may be implemented via a global information network, such as the worldwide web, wherein the pages would be presented to the user via a common web site which they are selectively enabled to access. In general, the system and methods according to the invention may be directed at particular users, wherein security means may be provided for limiting access only to authorized users. For example, access to the interactive web pages may be password coded or otherwise secured from unauthorized use.

Fig. 1 is directed to an opening page which shows in general the types of drill holders which may be designed by the user. In the preferred embodiment, upon entering the system, the user is provided with an item number as shown in Fig. 2, and the process of customized product design can be initiated. For the drill holders which are the subject of the preferred embodiments, as with a variety of other customized products and tooling, the products may be configured in a wide variety of ways to meet the users requirements. For drill holders which use one or more cutting inserts in association therewith to perform machining operations on workpieces, the tool design may begin with selection of a body type for the tool holder, such as shown in Fig. 2. Such body types may include various categories, which as shown in Fig. 2, may comprise special length, chrome helix, chrome bushing, or ICS body types having various step configurations. Using the interactive page as shown in Fig. 2, the particular body type for the drill holder desired by the user

may be selected. Fig. 3 shows an interactive page for use in specifying the characteristics of a special length type of drill holder according to the selection in Fig. 2. If a special length type of drill holder is selected by the user, the information as set forth in Fig. 3 is requested as part of the product specification. Where multiple options are provided for prompting the user, pull down menus such as shown at 10 may be conveniently used in the GUI set up. Further specifications for the drill holder, such as flute style as well as dimensional specifications are then prompted and supplied by the user as shown in Fig. 3. If one of the other body types as prompted in Fig. 2 is selected by the user, particular information relating to these other body types is requested from the user relating to each of the specific body types as shown in Figs. 4-5.

For certain machining applications, a drilling tool is designed to make different hole profiles. If special hole profiles are required, the tooling can be designed to meet these needs. Turning to Fig. 6, the user may be prompted to select a hole profile relating to the machining operation intended to be performed by the tooling being created. For producing a given hole profile, the characteristics of the holder being designed in conjunction with the cutting inserts to be used therewith allow the user to specify the type of ICS drill required for a particular machining operation. In a particular embodiment, ICS drills may be configured to have one or more steps to provide the desired hole form. Figs. 7 and 8 relate to a one-step design, wherein information related to the body for the desired ICS drill is requested. As shown in Fig. 8, as part of the specifications for a particular ICS drill, dimensional specifications are requested which define with particularity the characteristics of the drill holder to form a desired hole configuration, generally indicated at 12. Further, an ICS drill will normally include one or more cutting inserts used in conjunction with a primary blade insert positioned at the forward end of the drill holder. As shown at 14, a pull down menu may be provided to allow the user to select the manufacturer of a desired cutting insert, as well as to select the type of cutting insert at 16. Further, an item number relating to the type of cutting insert may be provided in a pull down menu 18, and the Find Available Numbers button 20 is used to select a given manufacturers cutting insert for use in the designed tooling. Further design specifications for such tooling are then prompted and input by the user as further shown in Fig. 8.

Alternatively, for, two or three step ICS drills, Figs. 9-14 follow similar requests for information relating to forming other particular hole configurations. As seen in Figs. 11 and 13, a two and three step ICS drill will include two or three cutting inserts

respectively in combination with the primary blade insert to be positioned at the forward end of the holder. Consequently, the prompted information requested from the user includes information relating to the plurality of cutting inserts to be used to form the desired hole configuration for the particular machining operation.

Turning to Fig. 15, further information relating to the customized tooling desired by the user is requested, more particularly relating to the shank style of the drill holder, allowing compatibility with the users particular machining apparatus and requirements. Figs. 16 and 17 show information requested for a Morse taper shank if such a shank is selected in the menu of Fig. 15. In addition to information relating to dimensional characteristics of the shank, additional information relating to through shank coolant and RCA options are requested in Fig. 17. Similarly, for the other shank options which can be selected in the menu of Fig. 15, the particular characteristics of each shank option is requested as shown in Figs. 18-27. For each selected shank option, the required information which would allow design of the particular drill holder desired is requested.

Once the information relating to the particular customized tooling, and in the case of the drill holder described in the preferred embodiment, the data can then be saved to a database for future use. The GUI thus provides a library of relationship driven web pages which guide a user through a series of interactive pages. The user is prompted for the necessary part specifications based upon the type of part desired for their particular application or requirements. As shown throughout the Figs., menu items may be provided to allow the user to move within the interactive system in various ways, such as shown at 22 in Fig. 1. The preferred system may also allow the user to create a new item, edit an existing item from saved data via a previous tool selection or creation session, or to copy an existing design via menu options provided in the GUI. These functions simplify the ability of the user to respecify and order the desired customized tooling, or to modify an existing design to desired new parameters.

Once tooling is created, copied or edited, the user is forwarded to a page, the preferred embodiment being shown in Fig. 28, which allows information relating to the user to be acquired, and thereafter to allow the user to generate a quote, to order the generated item or to view a drawing of the generated item by selection of the appropriate menu button shown at 24.

To generate a quote, the system and methods according to the invention preferably use the information acquired through the interactive relationship driven pages described above, which specify the characteristics of the customized tooling desired by the user. As

part of the process of preparing a quote from the information provided by the user, the characteristics of the customized tooling or part are preferably analyzed in terms of feasibility and engineering acceptability, as well as manufacturing acceptability. The invention allows determination of whether the part specified by the user meets standard design criteria or manufacturing feasibility criteria to allow manufacturing using existing manufacturing equipment or resources. In the case of a drill holder as discussed in the preferred embodiment, a feasibility analysis may be conducted by generating a solid model representation of the part to the users input specifications, and thereafter predetermined distances, clearances, surfaces and interrelationship between surfaces, or other characteristics of the part can be analyzed. In the preferred embodiment, the feasibility analysis is conducted automatically via software in conjunction with a solid modeling software package such as a computer aided design (CAD) package. The measured values from the feasibility assessment can then be compared with design requirements specified by the manufacturer or in relation to the resources available to the manufacturer. If the design as specified by the user does not meet design criteria or other critical criteria, the user will be informed of the problem(s) along with suggestions for correction of possible errors. The system may also direct the user to a particular interactive page where a possible error occurred if an on-line system is used. In general, the step of quoting a customized part will not be taken unless the design criteria is verified as being valid.

Assuming that the part design is determined to be valid, the preferred embodiment of the invention allows generation of an engineering drawing of the created part for review by the user.

Turning to Fig. 29, a preferred program which automates the feasibility assessment and creation of a drawing related to a part for which the design criteria has been validated. In Fig. 29, the drawing/feasibility program is implemented at **30** upon implementation of the quotation system or operation of the Quote Item button at **24** in Fig. 28. Item numbers relating to creation of a drawing or feasibility assessment are provided, and a designation as to whether a drawing, feasibility or both are created is made to identify information related to a particular users design. If a drawing is to be created, a retrieve drawing subroutine function is implemented at **32**, with an item number passed as an input to the function. The retrieve drawing subroutine is implemented at **34**, and functions to read information relating to the customized design input by the user into the data structure for a drawing file, preferably associated with a

solid modeling drawing package as previously described. Using the users specific data, a drawing is regenerated using values read as to the customized product specified by the user, and outputs a plot file to the drawing program. Using a base tool configuration, and modifying the base configuration according to the particular design characteristics input by the user allow simplified and fast processing and generation of a specific engineering drawing reflecting the users design criteria.

If a feasibility assessment is to be performed, it is implemented at 32 and calls up a feasibility analysis subroutine function at 36. This function reads part information as supplied by the user for the customized design into a data structure. The subroutine function retrieves a feasibility model for the base product design, and regenerates the design using values read from the user input data. Predetermined design criteria are analyzed in function 36 to verify feasibility and/or manufacturability of the customized product. In many situations, both of the functions to render a drawing as well as conduct a feasibility assessment of the customized part are performed, and implemented at 32 accordingly. Depending upon the results of the drawing creation function at 34 or feasibility assessment at 36, the results are output at 38 which in turn may be forwarded to the interactive system described above at 40. If any error in the drawing and/or feasibility assessment are found, an error message will be forwarded to the user as previously described. Alternatively, if the design criteria are valid, and a drawing generated, the user may view the drawing using the menu button at 24 (see Fig. 28). Information may also be output to various databases for creation and keeping of records or other information relating to the customized product at 42 and 44 as examples.

Fig. 30 shows an example of a generated drawing using the program as described with reference to Fig. 29, in conjunction with a solid modeling drawing package. To create the drawing, the part specifications are transferred to a drawing subroutine program working in conjunction with a solid modeling software package. The subroutine program automatically creates a customer drawing reflecting the users specifications. The drawing is created using the solid modeling software package, and then may be converted to a format that is compatible with any standard web browser as an example, and returned to the user.

The drawing may be used to confirm design criteria, and may be provided to the user for approval should the design part be ordered. Such approval may be specified by signing and dating the approved drawing at 50 as shown in Fig. 30.

Once feasibility of the design criteria has been ascertained, the system and methods according to the invention also desirably generate a specific quote for the customized product created by the user. The information from the quoting program may then be forwarded and displayed on a quote form such as shown in Fig. 31. To generate the quote information, a costing subroutine may be utilized, such as shown in Fig. 32 at 52 by reference to item numbers corresponding to customized items presented by a user as described above. Errors are checked with respect to the information relating to an item submitted for costing at 54, and a costing subroutine function may be implemented at 56. The costing function 56 may read item information related to the customized item into a data structure and reads inputs from another database 58 relating to manufacturing methods potentially used to produce the customized specific item and costing information relating thereto. This process is reiterated for a plurality of possible manufacturing approaches to producing the item, and ultimately the information is output to the interactive system at 60 for preparation of the quote as shown in Fig. 31. As shown in Fig. 33, a purchase order containing the users information as well as shipping information and a description of the item as well as quoted pricing and delivery schedules may be generated. The user may place an order for the created item, or reset the form via user buttons 52. The user can specify the quantity at 54 and any shipping instructions at 56. In the preferred embodiment, the automated quoting system determines the prices that will be offered to the customer and interrogates the parts specifications to determine these parameters. In a preferred embodiment, the cost for the specified item is determined by analyzing a plurality of manufacturing methods for the most cost-effective approach, on which offered pricing will be based. The cost for each of a plurality of manufacturing techniques are calculated and compared with each other, and the selected cost and delivery schedule for the item can then be displayed on the purchase order as shown in Fig. 33.

Although the present invention has been described above in detail, the same is by way of illustration and example only and is not to be taken as a limitation on the present invention. Further, as described above, the system and methods according the invention may be used in conjunction with other types of customized products wherein characteristics of the products are supplied by a user to generate specific information related to design criteria and/or cost and supply information. Accordingly, the scope and content of the present invention are to be defined only by the terms of the appended claims. Other aspects of the invention are included in attached Appendix A and B.

What is Claimed is:

1. A computer network system for designing a drilling tool and generating a quotation for the purchase of a designed tool comprising

a user interface to receive information regarding an application for which a drilling tool is to be designed and characteristics of the drilling tool,

a server configured to receive information supplied by a user via the user interface and use the received information to generate a drilling tool design,

wherein the server is provided with computer readable program code to generate a quotation for the manufacture and sale of a drilling tool design according to the information received form the user.

2. A method for generating a quotation for a drilling tool comprising the steps of:

1) receiving information from a user via a user interface in a computer network relating to a drilling tool for a predetermined machining operation,

2) using the received information to design the drilling tool according to the users specifications, and

3) generating a quotation for the manufacture and sale of the drilling tool as designed.

3. A computer system having a computer readable program code embodied therein for quotation of tooling for a predetermined machining process comprising

a user interface,

computer readable program code configured to prompt the input of information relating to the tooling and predetermined machining process via the user interface,

computer readable program code configured to use the information input via the user interface and generate a quotation for the manufacture and sale of the tooling.


Advanced
QDS
Previous
AMEC Home
Edit Item
Copy Item
Create Item
22
Welcome Greg,
Create Your Own Special Product Quickly & Easily with Allied's New Virtual Quoting System.
Flanged Shank ICS - 1 Step
Straight Shank Chrome Helix
Real Time Specials Quoting & Customer Approval Prints
Straight Shank ICS - 3 Step

FIG. - 1

Your Item Number is 991223-118

Select a body type to begin Special Product Creation.

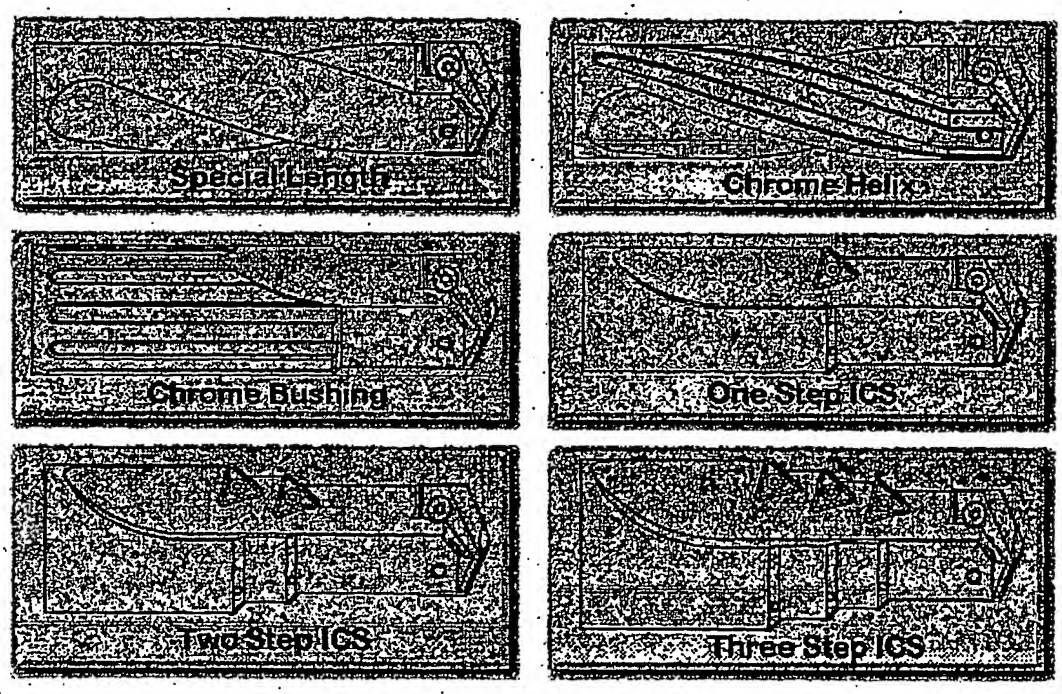


FIG. - 2

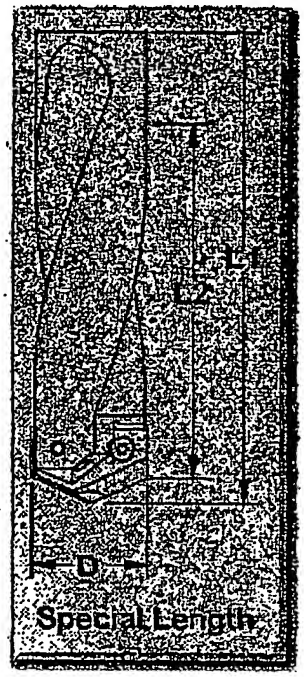
Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

SPECIAL LENGTH DRILLS

Special length holders are designed for use in applications where the customer's drill depth requirements are not met with our standard product. This can include tools that are longer than our extended length holders, as well as specific tool lengths for machine restrictions. These tools have all the advantages of our standard holders along with expanded shank and coolant selections.



10

Holder Series: 2

Dimension Units: ◉ inches ○ mm

Select The Flute Style: ○ Straight Flute ◉ Helical Flute

Tool Ref Length: (L1) 6.0

Drill Depth: (L2) 4.0

Body Diameter: ◉ Standard

○ Blade Specific

Blade Diameter (D)

Black Oxide: ○ Yes ◉ No

Previous | QDS Help | AMEC Home | QDS Home | Continue

FIG. - 3

Advanced QDS

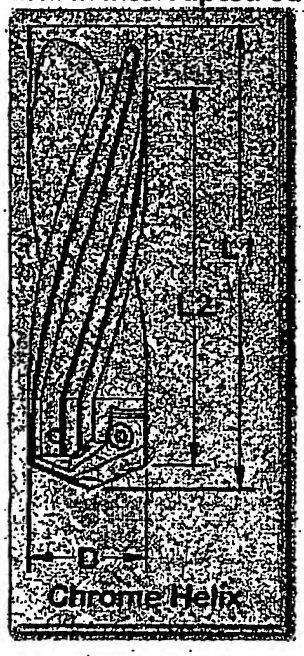
Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

CHROME HELIX DRILLS

Chrome-Helixed drills for dedicated sizes allow the Allied T-A® Drill Insert to work in the same type of applications as twist drills. This replaceable tip oil hole drill offers higher production rates and longer tool life without any need to adjust machine length settings when the drill tip is changed. The replaceable drill tips, in various material grades and coatings, make this product cost effective in a wide range of applications.

Chrome-Helixed drills should be run with coolant through the tool, as should all drill holders. Chrome-Helix holders can be used to stabilize the drill in interrupted cuts or when hole straightness is important.



Dimension Units: ◉ inches ○ mm

Select The Flute Style: ○ Straight Flute ◉ Helical Flute

Tool Ref Length: (L1) 6.0

Drill Depth: (L2) 4.0

Blade Diameter: (D) 0.9688

Black Oxide: ○ Yes ◉ No

Previous | QDS Help | AMEC Home | QDS Home | Continue

FIG. - 4

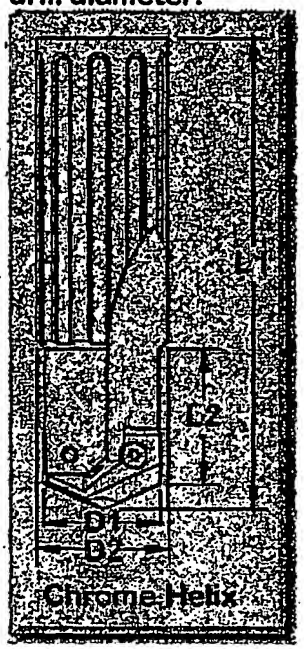
Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

CHROME BUSHING DRILLS

Bushing drills are used to reduce setup times and increase production on shallow, single position or gang drilled holes. This design allows the use of multiple T-A® drill diameters in one holder without any need to change the bushing arrangement. The holder bearing diameter is typically sized to fit through a standard drill bushing. To take full advantage of this technique, always size the bushing diameter a maximum of 1/32" larger than the maximum drill diameter. To assure that adequate support is maintained by the bushing, it is recommended the drill depth not exceed three times the drill diameter.



Dimension Units:	◉ inches ○ mm
Tool Ref Length: (L1)	6.0
Drill Depth: (L2)	4.0
Blade Diameter: (D1)	0.9688
Bushing Diameter: (D2)	1.25
Black Oxide:	○ Yes ◉ No

Previous | QDS Help | AMEC Home | QDS Home | Continue

FIG. - 5

Your Item Number is 991228-100

Select a Hole Profile to continue Special Product Creation.

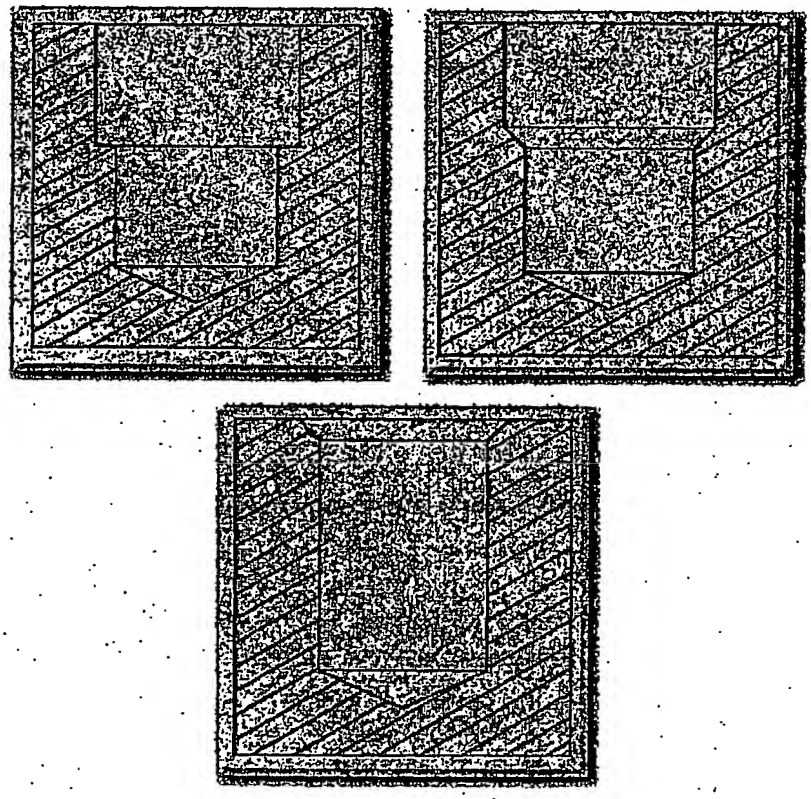


FIG. - 6

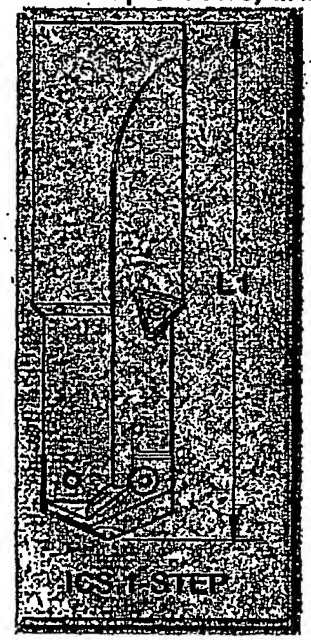
Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

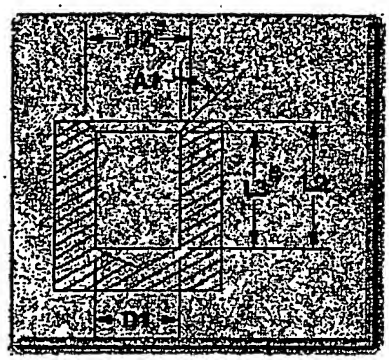
ICS DRILLS - 1 STEP

ICS Drills are used as high production replacements for Sub-Land and other Form Drills. Typical applications include drill and counter bore for socket head cap screws, drill and chamfer for tapped holes and other hole forms.



Input Units	(•) inches ( ) mm
Flute Style	(•) Straight ( ) Helical
Reference Length (L1)	6.0
Black Oxide	( ) Yes (•) No

FIG. - 7



Drill Diameter (D1) 1.0
Drill Depth (L2) 4.0
Angle (A1) 45.0
Gage Length (L3) 3.9375
Diameter (D2) 1.125

12

- Choose the primary hole dimension ○L3 ◉D2

- Corresponding length and diameter can not be entered for the same tool

16

14

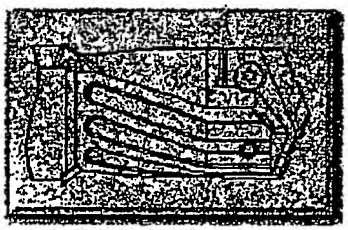
Step 1 Insert Mfg Arno

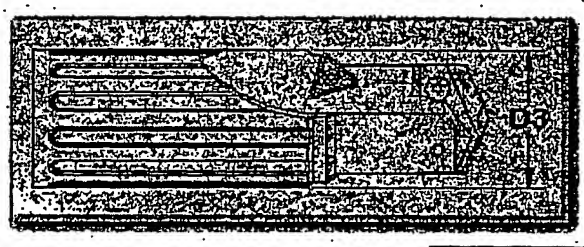
Triangle 80 Deg 55 Deg 35 Deg Sq

Item Number TCGT 2(1.5)2 ◉ ANSI ○ ISO

18

20 Find Available Numbers





Chrome Plated Pilot In Front Of The Inserts ○ Yes ◉ No

Chrome Plated Bearing Area Behind The Inserts ○ Yes ◉ No

0.0 Bushing Dia (

Previous | QDS Help | AMEC Home | QDS Home | Continue

FIG. - 8

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home

Select a Hole Profile to continue Special Product Creation.

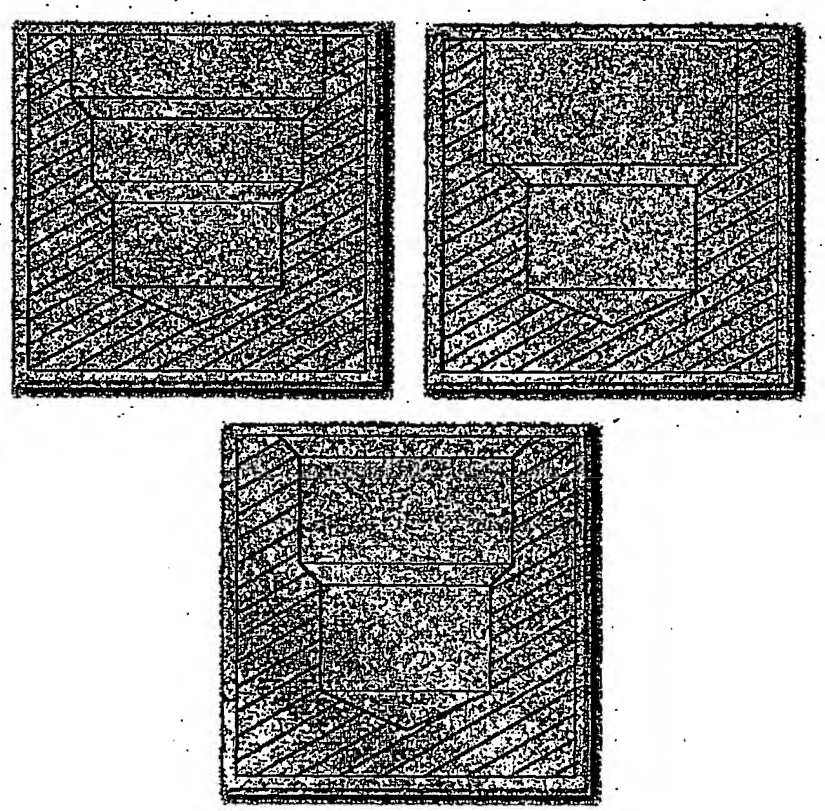


FIG. - 9

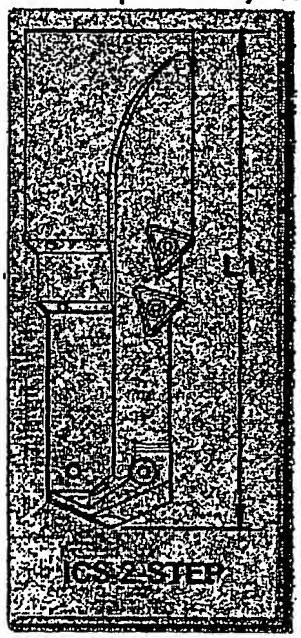
Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

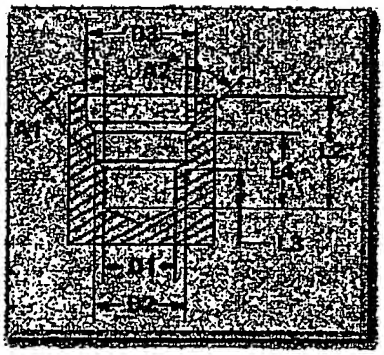
ICS DRILLS - 2 STEP

ICS Drills are used as high production replacements for Sub-Land and other Form Drills. Typical applications include drill and counter bore for socket head cap screws, drill and chamfer for tapped holes and other hole forms.



Input Units	◉ inches ○ mm
Flute Style	◉ Straight ○ Helical
Reference Length (L1)	6.0
Black Oxide	○ Yes ◉ No

FIG. - 10



Step 1

Drill Diameter (D1) 1.0

Drill Depth (L2) 4.0

Step 2

Angle (A1) 45.0 (A2) 90.0

Gage Length (L3) 1.5 (L4) 2.0

Diameter (D2) 1.125 (D3) 1.25

Step 1 Insert Mfg Arno

Triangle 80 Deg 55 Deg 35 Deg Sq

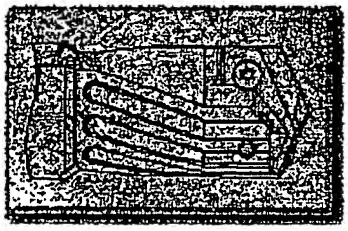
Item Number TCGT 2(1.5)2 ANSI ISO

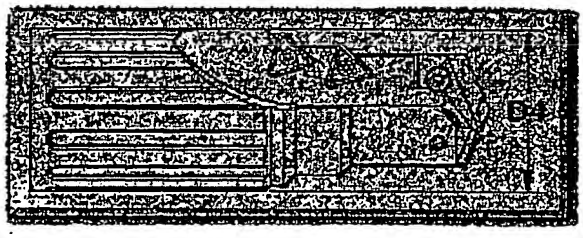
Step 2 Insert Mfg Arno

Triangle 80 Deg 55 Deg 35 Deg Sq

Item Number TCMT 2(1.5)2 ANSI ISO

Find Available Numbers





Chrome Plated Pilot In Front Of The Inserts Yes No

Chrome Plated Bearing Area Behind The Inserts Yes No

Bushing Dia (

Previous QDS Help AMEC Home QDS Home Continue

FIG. - 11

Your Item Number is 991228-100

Select a Hole Profile to continue Special Product Creation.

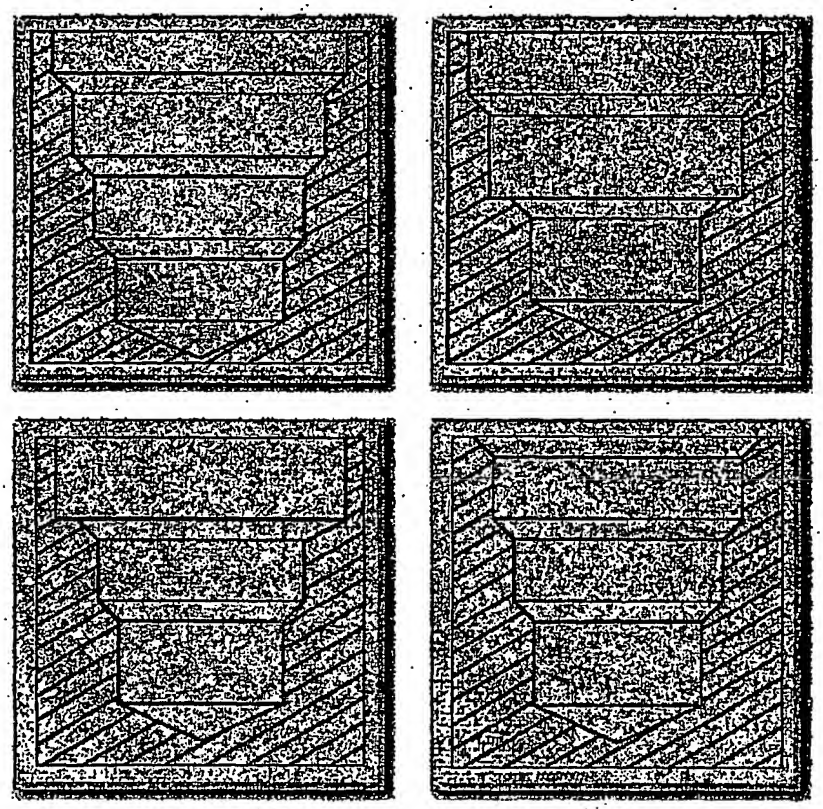


FIG. - 12

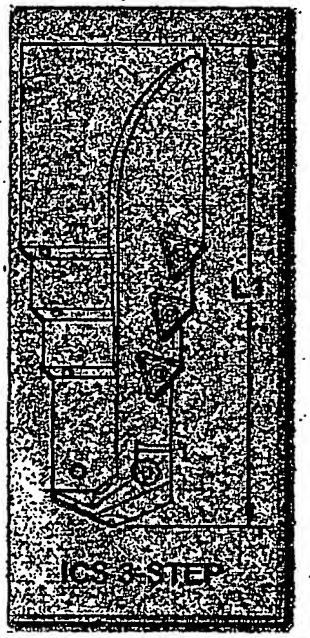
Advanced QDS

Your Item Number is 991228-100

< Previous | QDS Help | AMEC Home | QDS Home | Continue >

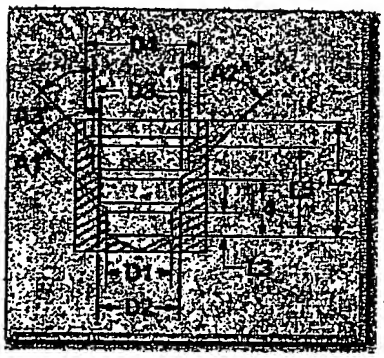
ICS DRILLS - 3 STEP

ICS Drills are used as high production replacements for Sub-Land and other Form Drills. Typical applications include drill and counter bore for socket head cap screws, drill and chamfer for tapped holes and other hole forms.



Input Units	◉ inches ○ mm
Flute Style	◉ Straight ○ Helical
Reference Length (L1)	6.0
Black Oxide	○ Yes ◉ No

FIG. - 13



		Step 1		Step 2		St
Drill Diameter	(D1)	1.0				
Drill Depth	(L2)	4.0				
Angle	(A1)	45.0	(A2)	90.0	(A3)	4
Gage Length	(L3)	1.5	(L4)	2.0	(L5)	2
Diameter	(D2)	1.125	(D3)	1.25	(D4)	1

^ - Enter 90° for a counterbore

Step 1 Insert Mfg: Arno — Triangle | 80 Deg | 55 Deg | 35 Deg

Item Number: TCGT 2(1.5)2 — ANSI / ISO

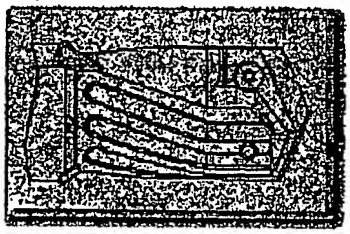
Step 2 Insert Mfg: Arno — Triangle | 80 Deg | 55 Deg | 35 Deg

Item Number: TCMT 2(1.5)2 — ANSI / ISO

Step 3 Insert Mfg: Arno — Triangle | 80 Deg | 55 Deg | 35 Deg

Item Number: TCMT 2(1.5)2 — ANSI / ISO

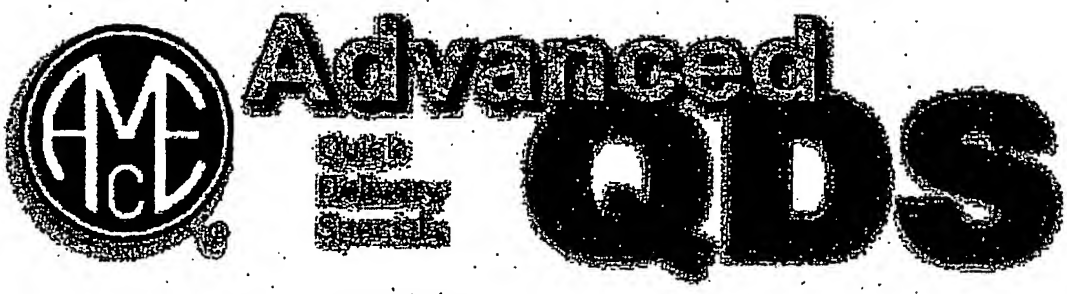
Find Available Numbers



Chrome Plated Pilot In Front Of The Inserts: Yes / No

Previous | QDS Help | AMEC Home | QDS Home | Continue

FIG. - 14



Your Item Number is 991228-100

Select a Shank style to continue Special Product Creation.

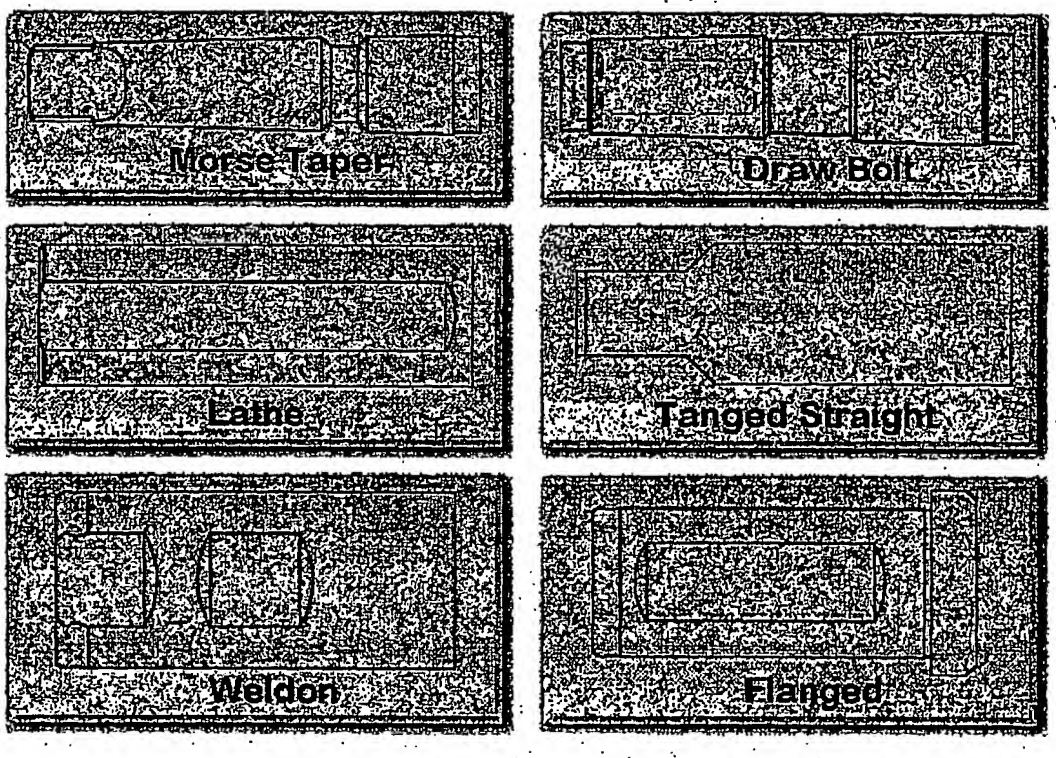


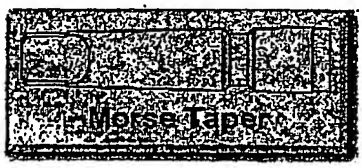
FIG. - 15

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Morse Taper Shank Options



Shank Options

Taper Size: 3

English or Metric Taper: ◉ English ○ Metric

Thru Shank Coolant & RCA Options

FIG. - 16

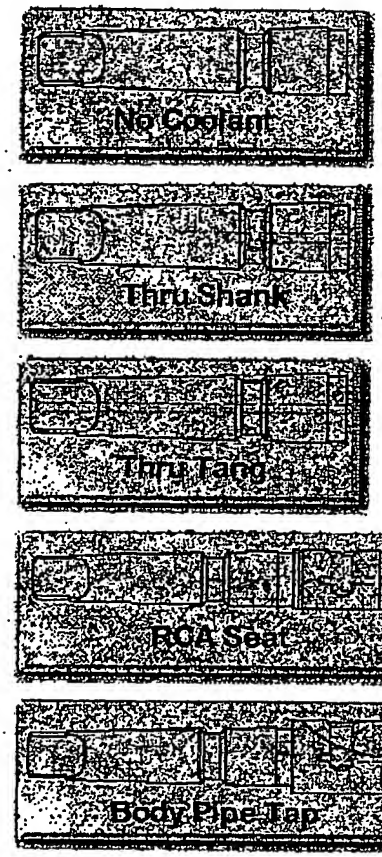

No Coolant
Thru Shank
Thru Tang
RCA Seat
Body Pipe Tap
No Coolant
Thru Shank Coolant
Thru Tang Coolant
RCA Coolant Seat
No RCA
RCA Size
Body Side Coolant
No Body Side
Body Tap Size
Previous
QDS Help
AMEC Home
QDS Home
Continue

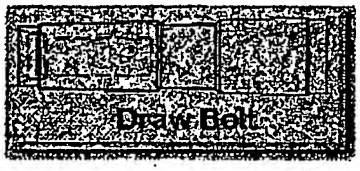
FIG. - 17

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Draw Bolt Shank Options

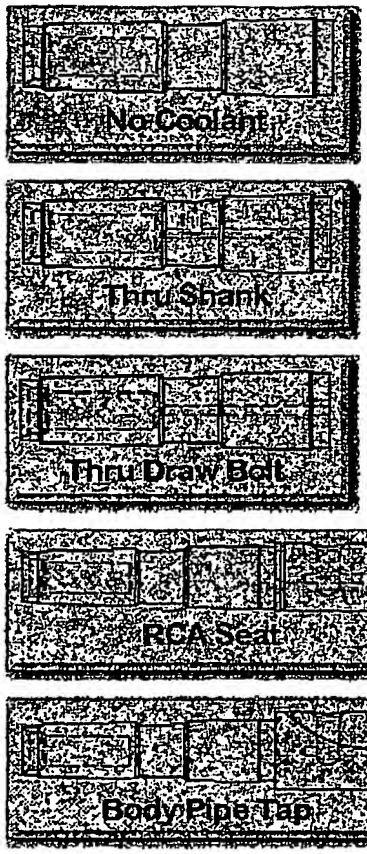


Shank Options

Taper Size: 3

Thru Shank Coolant & RCA Options

FIG. - 18



○ No Coolant

◉ Thru Shank Coolant

○ Thru Draw Bolt Coolant

○ RCA Coolant Seat

No RCA ▼ RCA Size

○ Body Side Coolant

No Body Side ▼ Body Tap Size

Previous | QDS Help | AMEC Home | QDS Home | Continue

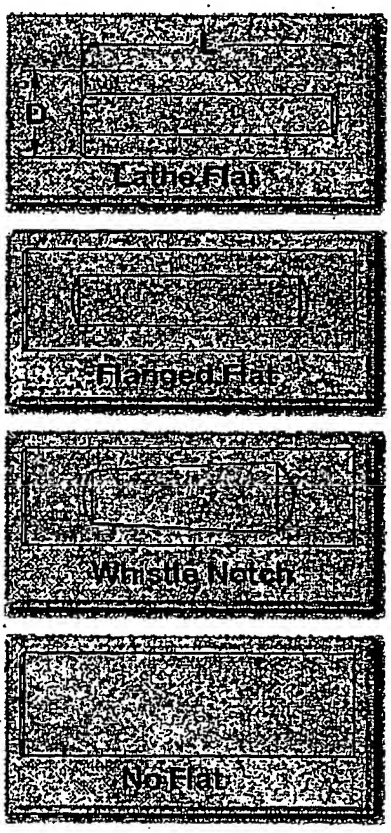
FIG. - 19

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Lathe Shank Options



Shank Options

Shank Flat Options: Lathe Flat

Shank Diameter Options

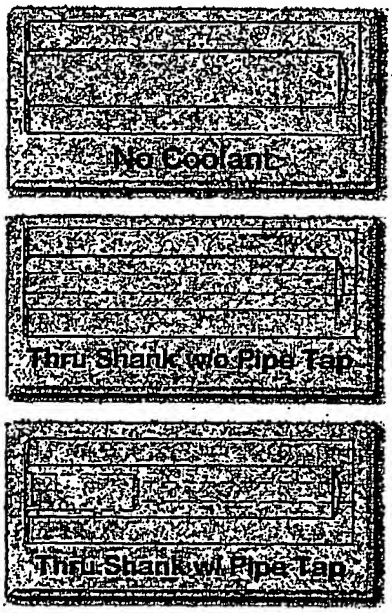
English	Metric
1/2 in	20 mm
3/4 in	25 mm
1 in	32 mm
1-1/4 in	40 mm
1-1/2 in	
1-3/4 in	
2 in	
2-1/2 in	
3 in	

Shank Length: 3 mm.

get standard

FIG. - 20

Thru Shank Coolant Options



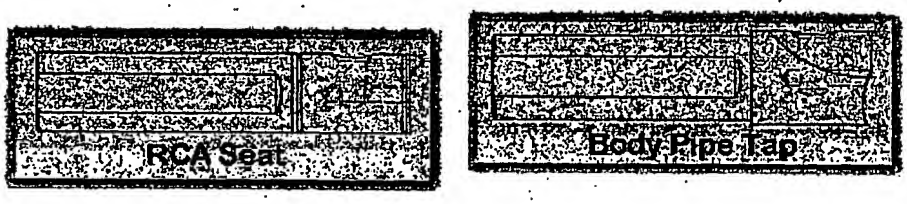
○ No Thru Shank Coolant

◉ Thru Shank Coolant w/o Pipe Tap

○ Thru Shank Coolant w/Pipe Tap

No Thru Shank C ▼ Shank Tap Size

RCA and Body Side Coolant Options



◉ None

○ RCA Size No RCA ▼

○ Body Tap Size 1/8-27 BSPT ▼

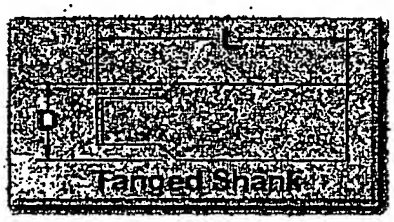
FIG. - 21

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Tanged Straight Shank Options



Shank Options

Shank Units: ◉ inches ○ mm

Shank Diameter: 1 in.

Shank Length: 3.0 in.

Thru Shank Coolant & RCA Options

FIG. - 22

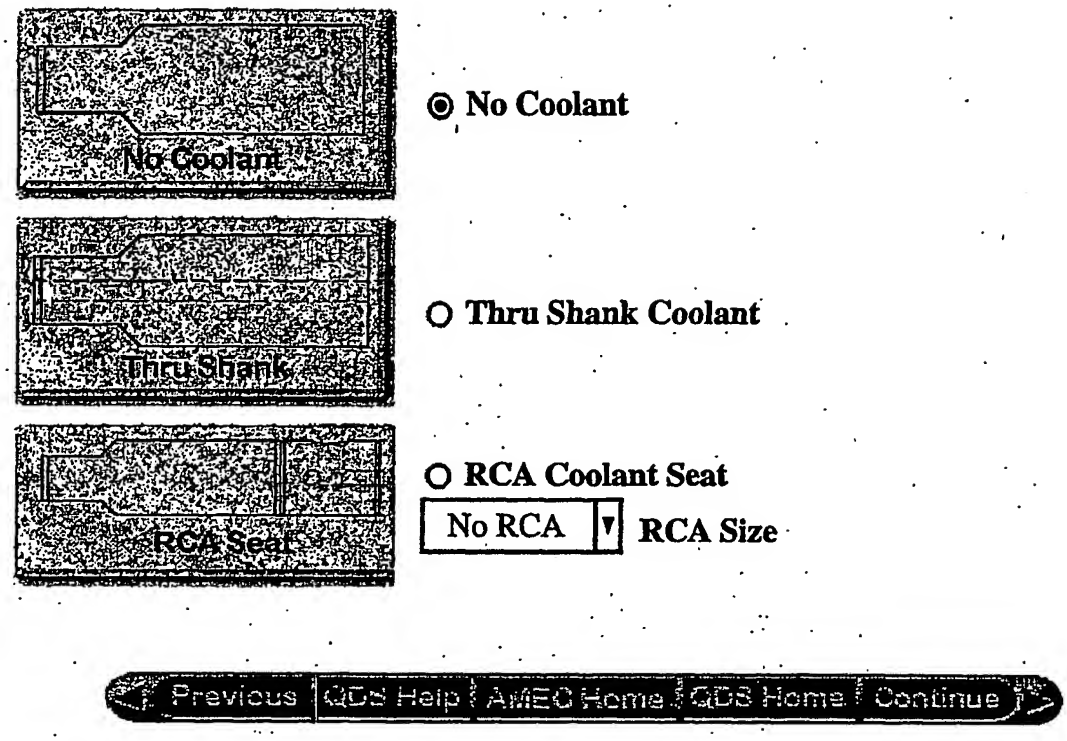

No Coolant
Thru Shank
RCA Seat
No Coolant
Thru Shank Coolant
RCA Coolant Seat
No RCA
RCA Size
Previous
QDs Help
AMEC Home
QDS Home
Continue

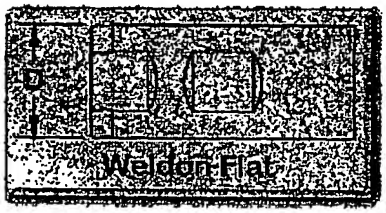
FIG. - 23

Advanced QDS

Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Weldon Shank Options

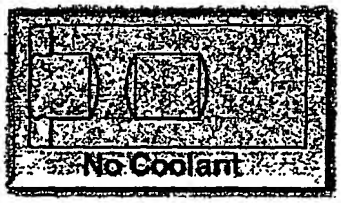


Shank Diameter Options

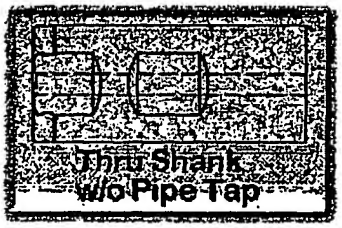
British	Metric
○ 1/2 in	○ 16 mm
○ 3/4 in	○ 20 mm
◉ 1 in	○ 25 mm
○ 1-1/4 in	○ 32 mm
○ 1-1/2 in	○ 40 mm
○ 2 in	○ 50 mm
○ 2-1/2 in	○ 63 mm

Thru Shank Coolant Options

FIG. - 24



◉ No Coolant

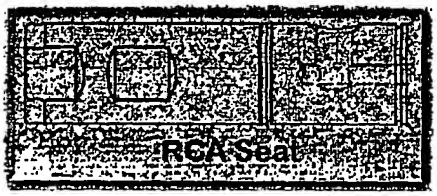


○ Thru Shank Coolant wo/Pipe Tap

○ Thru Shank Coolant w/Pipe Tap

No Thru Shank Coolant ▼ Shank Tap Size

RCA and Body Side Coolant Options



◉ None

○ RCA Size No RCA ▼

○ Body Tap Size 1/8-27 BSPT ▼

Previous | QDS Help | AMEC Home | QDS Home | Continue

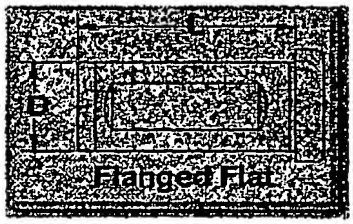
FIG. - 25

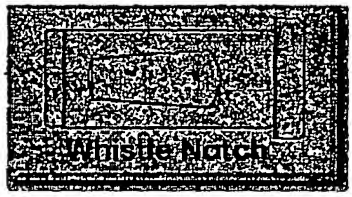
Advanced QDS

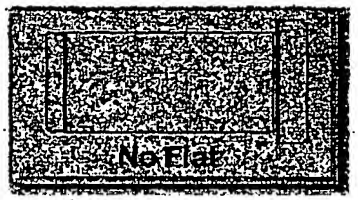
Your Item Number is 991228-100

Previous | QDS Help | AMEC Home | QDS Home | Continue

Flanged Shank Options







Shank Options

Shank Flat Options: Flanged Flat

Drive Notch Option: ○ Yes ◉ No

Shank Diameter Options

Inches	Metric
○ 3/4 in	○ 20 mm
◉ 1 in	○ 25 mm
○ 1-1/4 in	○ 32 mm
○ 1-1/2 in	○ 40 mm
	○ 50 mm

Shank Length: 2.281 in. get stan

Thru Shank Coolant Options

FIG. - 26

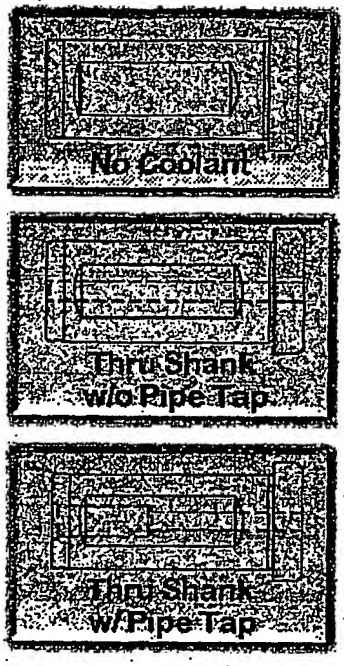

No Coolant
Thru Shank w/o Pipe Tap
Thru Shank w/Pipe Tap
No Coolant
Thru Shank Coolant wo/Pipe Tap
Thru Shank Coolant w/Pipe Tap
No Thru Shank
Shank Tap Size
Previous
QDS Help
AMEC Home
QDS Home
Continue

FIG. - 27


Advanced
QDS
Your Item Number is 991228-100
Previous
QDS Help
AMEC Home
QDS Home
Item Number: 991228-100
Item Description: Flange Shank Two Step ICS Holder
Contact Name
Customer Tool Number
Display Units For Drawing
inch
mm
Quote Item
View Item
Order Item
24

FIG. - 28

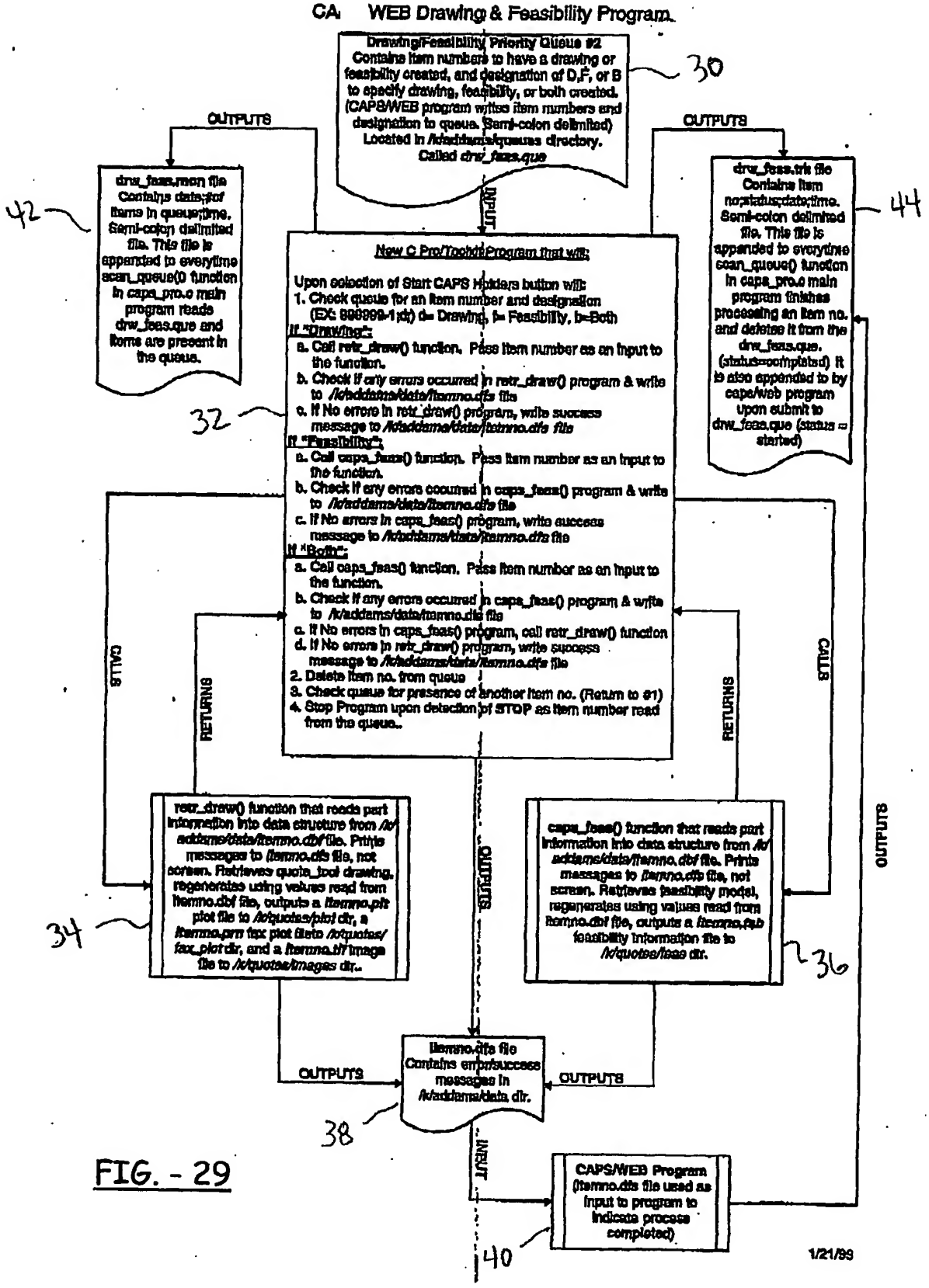
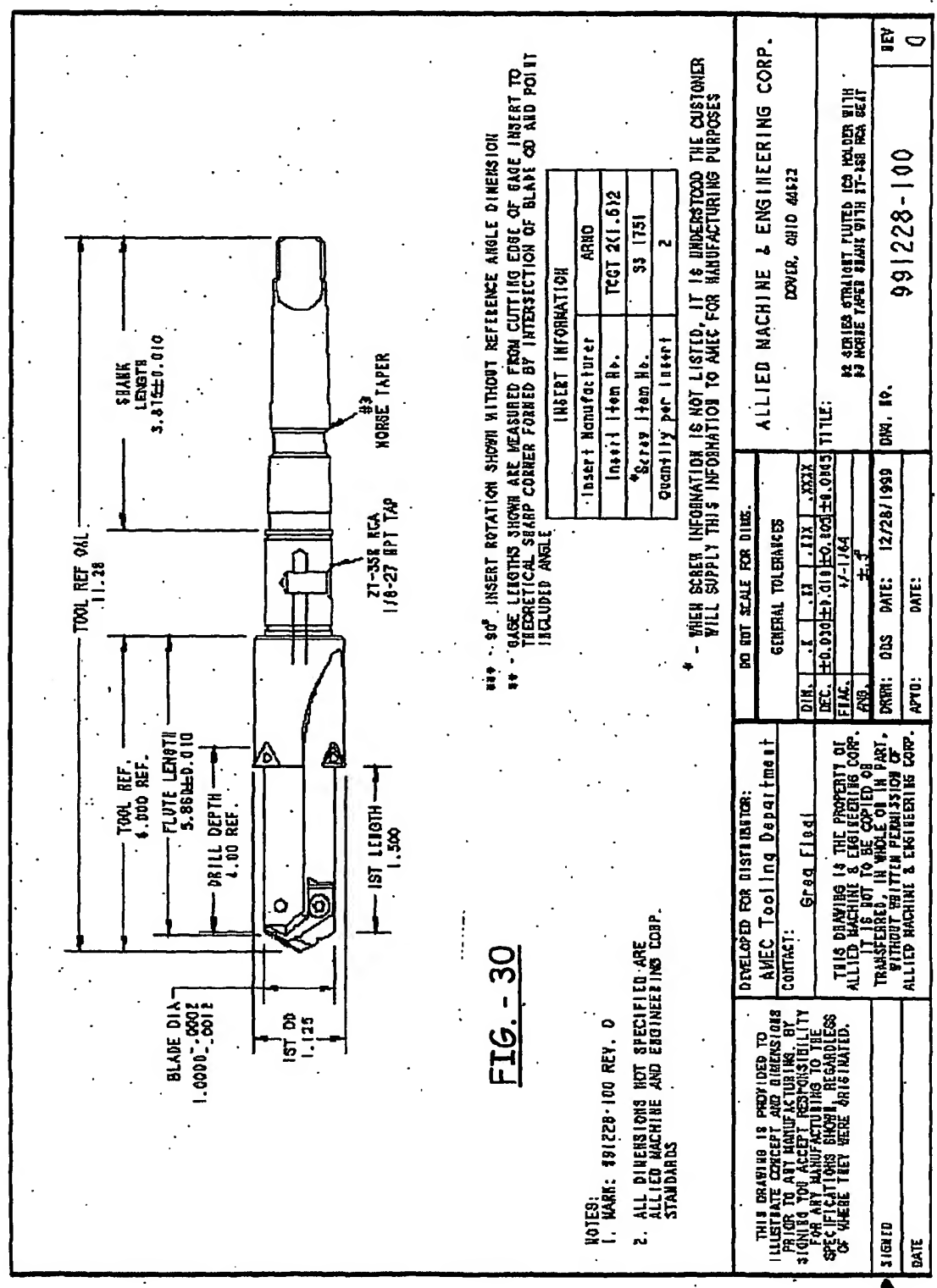

CA WEB Drawing & Feasibility Program
Drawing/Feasibility Priority Queue #2
Contains item numbers to have a drawing or feasibility created, and designation of D,F, or B to specify drawing, feasibility, or both created. (CAPS/WEB program writes item numbers and designation to queue. Semi-colon delimited) Located in /k/addams/queues directory. Called drw_feas.que
30
OUTPUTS
OUTPUTS
drw_feas.mon file Contains date;for items in queue;time. Semi-colon delimited file. This file is appended to everytime scan_queue() function in capa_pro.c main program reads drw_feas.que and items are present in the queue.
42
drw_feas.trk file Contains item no;status;date;time. Semi-colon delimited file. This file is appended to everytime scan_queue() function in capa_pro.c main program finishes processing an item no. and deletes it from the drw_feas.que. (status=completed) It is also appended to by caps/web program upon submit to drw_feas.que (status = started)
44
INPUT
New C Pro/Toolkit Program that will:
Upon selection of Start CAPS Holders button will:
1. Check queue for an item number and designation (EX: 999999-1.pt) d= Drawing, f= Feasibility, b=Both
If "Drawing":
a. Call retr_draw() function. Pass item number as an input to the function.
b. Check if any errors occurred in retr_draw() program & write to /k/addams/data/itemno.dfs file
c. If No errors in retr_draw() program, write success message to /k/addams/data/itemno.dfs file
32
If "Feasibility":
a. Call capa_feas() function. Pass item number as an input to the function.
b. Check if any errors occurred in capa_feas() program & write to /k/addams/data/itemno.dfs file
c. If No errors in capa_feas() program, write success message to /k/addams/data/itemno.dfs file
If "Both":
a. Call capa_feas() function. Pass item number as an input to the function.
b. Check if any errors occurred in capa_feas() program & write to /k/addams/data/itemno.dfs file
c. If No errors in capa_feas() program, call retr_draw() function
d. If No errors in retr_draw() program, write success message to /k/addams/data/itemno.dfs file
2. Delete item no. from queue
3. Check queue for presence of another item no. (Return to #1)
4. Stop Program upon detection of STOP as item number read from the queue..
CALLS
RETURNS
RETURNS
CALLS
OUTPUTS
retr_draw() function that reads part information into data structure from /k/addams/data/itemno.dbf file. Prints messages to itemno.dfs file, not screen. Retrieves quote_tool drawing, regenerates using values read from itemno.dbf file, outputs a itemno.plt plot file to /k/quotes/plot dir, a itemno.prn fax plot file to /k/quotes/fax_plot dir, and a itemno.tif image file to /k/quotes/images dir..
34
capa_feas() function that reads part information into data structure from /k/addams/data/itemno.dbf file. Prints messages to itemno.dfs file, not screen. Retrieves feasibility model, regenerates using values read from itemno.dbf file, outputs a itemno.fsb feasibility information file to /k/quotes/feas dir.
36
OUTPUTS
OUTPUTS
OUTPUTS
itemno.dfs file Contains error/success messages in /k/addams/data dir.
38
INPUT
CAPS/WEB Program (itemno.dfs file used as input to program to indicate process completed)
40
1/21/99

FIG. - 29


TOOL REF OAL
11.28
SHANK LENGTH
3.81±0.010
TOOL REF.
6.000 REF.
FLUTE LENGTH
5.86±0.010
DRILL DEPTH
4.00 REF.
BLADE DIA
1.0000 -.0002 -.0012
1ST DD
1.125
1ST LENGTH
1.500
2T-358 RCA
1/8-27 NPT TAP
#3
MORSE TAPER
INSERT INFORMATION
Insert Manufacturer
ARNO
Insert Item No.
TCGT 2(1.6)2
*Screw Item No.
S3 1751
Quantity per Insert
2
NOTES:
1. MARK: 991228-100 REV. 0
2. ALL DIMENSIONS NOT SPECIFIED ARE ALLIED MACHINE AND ENGINEERING CORP. STANDARDS
FIG. - 30
*** - 90° INSERT ROTATION SHOWN WITHOUT REFERENCE ANGLE DIMENSION
** - GAGE LENGTHS SHOWN ARE MEASURED FROM CUTTING EDGE OF GAGE INSERT TO THEORETICAL SHARP CORNER FORMED BY INTERSECTION OF BLADE OD AND POINT INCLUDED ANGLE
* - WHEN SCREW INFORMATION IS NOT LISTED, IT IS UNDERSTOOD THE CUSTOMER WILL SUPPLY THIS INFORMATION TO AMEC FOR MANUFACTURING PURPOSES
THIS DRAWING IS PROVIDED TO ILLUSTRATE CONCEPT AND DIMENSIONS PRIOR TO ANY MANUFACTURING. BY SIGNING YOU ACCEPT RESPONSIBILITY FOR ANY MANUFACTURING TO THE SPECIFICATIONS SHOWN REGARDLESS OF WHERE THEY WERE ORIGINATED.
SIGNED
DATE
DEVELOPED FOR DISTRIBUTOR:
AMEC Tooling Department
CONTACT:
Greg Flodi
THIS DRAWING IS THE PROPERTY OF ALLIED MACHINE & ENGINEERING CORP. IT IS NOT TO BE COPIED OR TRANSFERRED, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF ALLIED MACHINE & ENGINEERING CORP.
DO NOT SCALE FOR DIMS.
GENERAL TOLERANCES
DIM. .X .XX .XXX
DEC. ±0.030 ±0.010 ±0.005
FRAC. +/-1/64
ANG. ±1°
DRWN: DDS DATE: 12/28/1999
APVD: DATE:
ALLIED MACHINE & ENGINEERING CORP.
DOVER, OHIO 44622
TITLE:
#2 SERIES STRAIGHT FLUTED ICD HOLDER WITH #3 MORSE TAPER SHANK WITH 1T-458 RCA SEAT
DWG. NO. 991228-100
REV 0
50

Allied Machine & Engineering *Corp* **T-A® Style Drilling Systems** **485 W. Third St. Dover, OH 44622** **Engineering Fax: (330)364-7666**	**Date: 12/28/1999** **Quotation Number: 500-44** *Please reference the above number when placing an order*
Cust #: 500	**Attn:** Greg Fiegl
Distributor: AMEC Tooling Department	
Address: *Do Not Ship!!!*	
	Country:
City:	**State:** **Zip:**
Phone:	**Fax:**
AMEC Rep: 003 House Account	

In responce to your query, we are please to quote as follows:

DESCRIPTION	QTY	LIST PRICE (U.S. $)	SCHEDULED LEAD TIME
#2 Series 1 Step T-A® ICS Holder With 5.860" Straight Flute, 4.00" Drill Depth, 2 IC Pockets, #3 Morse Taper Shank And RCA Seat For 2T-3SR, Per AMEC# 991228-100 Rev. 0	1	$458.00	25 Work Days
	2	$345.00	25 Work Days
	3	$307.00	25 Work Days
	4	$289.00	25 Work Days
	5-9	$269.00	30 Work Days
	10-14	$226.00	30 Work Days
	15-19	$212.00	30 Work Days
	20-24	$204.00	30 Work Days
	25-49	$199.00	30 Work Days
	50	$189.00	30 Work Days

Order Quantity Variance Table for Allowable Shipment Variance.
Order Quantities below 10 pcs. will be shipped at exact quantity unless otherwise approved by the customer

Order Quantitiy	Variance Amount	Order Quantitiy	Variance Amount
10-49	+/- 1	300-499	+/- 5
50 - 149	+/- 2	500+	+/- 10
150 - 299	+/- 3		

This Document will serve as our official responce. Please notify us if additional copies should be mailed.

Prices are valid for 90 days from quote date.

Shipment lead time is based on availability of material at time of order. If prior sale has occurred, a new delivery schedule will be quoted.

Shipment leadtime starts upon receipt of order as customer approved AMEC drawing when appropriate.

All special order cancellations are subject to a minimum of 10% cancellation charge. AMEC reserves the right to increase the cancellation charge as deemed necessary to cover costs associated with items being cancelled.

Allied Machine & Engineering *Corp*

This quote prepared by: **Advanced QDS**

FIG. - 31

APS/WEB Costing Program

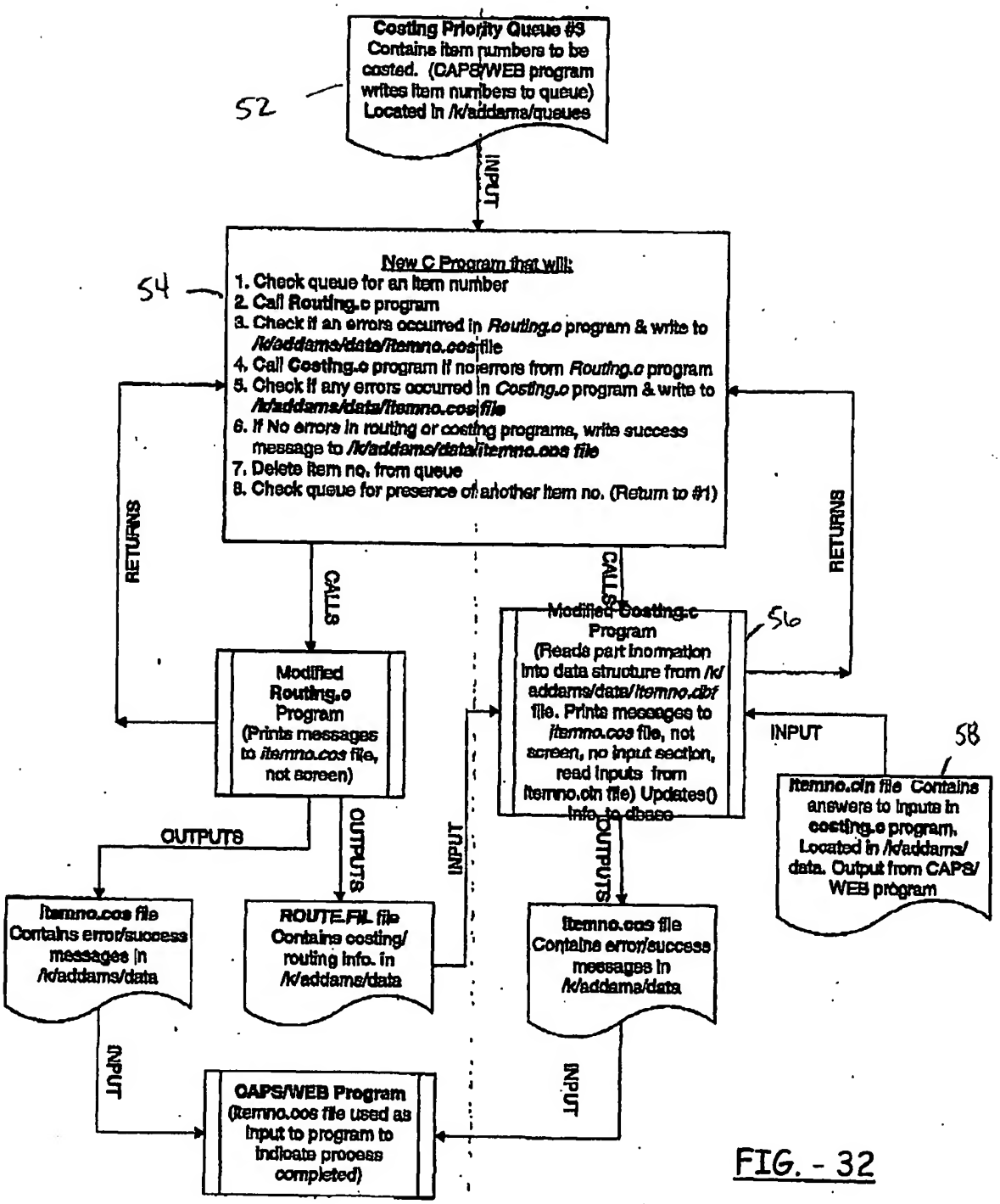


FIG. - 32

PURCHASE ORDER

Distributor Information	Order Date: 12/28/1999
Customer: 500, AMEC Tooling Department	Quote#: 500-44
Address: Do Not Ship!!!	Customer's Part #
City:	State:
Zip:	Country:
Fax:	Phone:
Sales Rep: 003 House Account	
Attn: Greg Fiegl	

Ship To Information (If different from Distributor Information)

Ship To:
Address:
City: State: Zip:
Attn:

Description	Quantity	Price	Schedule Lead Time
#2 Series 1 Step T-A® ICS Holder With 5.860" Straight Flute, 4.00" Drill Depth, 2 IC Pockets, #3 Morse Taper Shank And RCA Seat For 2T-3SR, Per AMEC# 991228-100 Rev. 0	1	$458.00	25 Work Days
	2	$345.00	25 Work Days
	3	$307.00	25 Work Days
	4	$289.00	25 Work Days
	5-9	$269.00	30 Work Days
	10-14	$226.00	30 Work Days
	15-19	$212.00	30 Work Days
	20-24	$204.00	30 Work Days
	25-49	$199.00	30 Work Days
	50	$189.00	30 Work Days

PO Number: Quantity: Shipping Instructions: UPS Ground

Place Order Reset Form

52 54 56

FIG. - 33